

SECOND EDITION

*A Brief Review
of the
South Pass Gold District,
Fremont County, Wyoming.*



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The South Pass Gold District.

• LOCATION AND TRANSPORTATION.

This district is situated in the south-central part of Fremont County, Wyoming, near the southern end of the Wind River range of mountains and about sixty miles in a direct line north of Point of Rocks station, on the Union Pacific railroad, the nearest railroad point.

A daily stage and mail route runs from Rawlins, on the Union Pacific railroad, to Lander, 135 miles, with connections at Meyersville, ninety miles out of Rawlins, for Lewiston, Atlantic and South Pass City.

Lander, the county seat of Fremont County, may be reached by team, about forty miles from South Pass, and stage connections there made for Thermopolis and Cody, on the Burlington and Missouri River railroad, and to Casper, on the Chicago and Northwestern railroad.

The principal road is from Rock Springs, on the Union Pacific railroad, a distance of eighty miles, having stations along the route and being used for freighting purposes.

The best method of reaching the district for a short stay is by team from Rock Springs, as the eighty miles to South Pass may be covered in two days without material inconvenience, and good accommodations had at Washington's ranch as a half way station. Stops may also be made at the Fourteen-Mile ranch, fourteen miles out of Rock Springs; at Zemba's Wells, twenty-five miles out, and at Pacific Springs, thirteen miles from South Pass. Teams may be had at Rock

Springs at reasonable rates, and drivers are furnished, if desired.

South Pass has the best hotel, and this may readily be made headquarters while the district is being investigated. Good meals and beds may also be had at Atlantic, and a new hotel is about to be erected at that place, which should be completed this season, and will insure ample accommodations.

HISTORY.

Gold was discovered in this region in 1842, and from that time until 1869 efforts were made to work the rich placers known to exist there, when the great rush to South Pass occurred in the latter year and the placers rich enough to pay when worked on a limited, crude scale were promptly worked out, and the miners sought other opportunities in the then new fields of Colorado and Montana.

During this time the Carissa lode was opened up and paid large returns, followed by the Miners' Delight at Peabody Hill, the Burr at Lewiston and numerous other properties that were worked for a time with great success, but were allowed to run down and were abandoned when the level of water and the base ores were reached.

Many attempts to start up these properties have been made, but usually by men of limited capital or little experience in mining, they becoming discouraged when they failed to treat the ores successfully, and for years little was done in the district, but with the new and cheaper methods of treatment and testing of refractory or difficult ores, which are particularly adapted for these ores, the district seems to be taking on new life and prosperity. A great many experiments on these ores have been made during the past year, and a number of men experienced in mining and ore treatment have taken hold of promising properties, all of which indicates a more extensive and *practical* development of the ores that certainly exist here.

GEOLOGY.

The district may be said to consist of an island of metamorphic schists of the Algonkian period lying upon the granites of the Archean, and with several intrusions of granite and dyke rocks in the schists at different localities.

The granites of this section of the Wind River Range are usually the common red feldsitic granites, and here show an occasional gray granite island or band, usually of limited extent. Dykes of diorite and allied rocks are also noted in the granite, but to the present time nothing of value has been reported from this region.

The schists show for a distance of about thirty miles long and from ten to twelve miles wide, the longer axis bearing northeasterly and southwesterly, in the same general direction as the strike of the schist, and with a general dip to the north, varying from 45° to the perpendicular.

Around these schists are the granites on the northwest and the succeeding sedimentary formations on the southerly sides.

The schists vary in composition in different parts of the district, but are usually hornblende schists, with some mica schist and chlorite schist associated therewith, and, as a rule, these varieties are very fine grained.

At various places, as near the William J. Bryan mine, formerly called the Rose, an exposure of a garnet schist is noted, and in the vicinity of the granites some gneisses are found, but these are usually of limited extent and only of local importance.

These schists frequently show tourmaline in small quantities and, locally, pyrite and magnetite are found as a constituent part of the schist.

Nearly all the rocks of this region, but especially the above mentioned schists, show strong evidences of alteration and change, in many instances giving an appearance entirely foreign to the character of the rock, but an examination with

an ordinary field lens is often sufficient to determine the true character at once.

This altering material is usually silica, and where the rocks are weathered, as on an exposed outcrop, a hard quartzose character is noted, and these are frequently called "dykes," but are simply altered schists and frequently carry gold values.

Dykes occur in these schists, especially in the old Miners' Delight mine at Peabody Hill, where diorite and diabase dykes are noted; at the Mary Ellen mine, near Atlantic; at the Carissa at South Pass, and along the northwestly edge of the schists in the vicinity of the Little Joe and at Gold Creek.

At the Miners' Delight, dykes of porphyritic material are noted, and these extend to the "Rustler Belt," north of Atlantic City, where the Mormon Crevice and Poirée Estate properties have produced very rich ore.

TOPOGRAPHY.

The district, topographically, is a series of broad table lands, devoid of timber, rising from the Sweetwater River Valley northward to the foot of the Wind River Mountains and cut by numerous creeks that furnish the water for the district, and whose beds and tributary gulches have held the placer gold that first attracted attention to this region. Willow Creek at South Pass, Rock Creek at Atlantic City and Strawberry Gulch at Lewiston are the principal creeks.

Four camps were established in the early days. But three of these survive, namely, South Pass, Atlantic and Lewiston, the camp at Miners' Delight being now deserted.

South Pass is the most westerly of these, and has been kept up for years by the work at the Carissa mine, this being the deepest and principal mine of the district.

THE CARISSA MINE.

This property, located in 1867, has been a phenomenal producer for many years, often under adverse conditions of

working and management, and is today the best known and developed property in the whole South Pass district.

The Carissa high grade ore occurs in quartz lenses, lying in the schist, having the same dip and strike as the schist, and these lenses occur at irregular intervals.

Associated with these quartz lenses are bodies of mineralized schist carrying pay values in gold, and lying between or near the quartz lenses have been found schist ores of very high grade, but with the usual intervals of lower grade material in the same ore.

Until recently the development of these ores has been carried on on the high grade lenses above mentioned, and the low grade ores practically ignored, owing to lack of facilities for treating them profitably, but during the past winter a cross-cut has been run west from the lower or 400-foot level, and the occurrence condition of these low grade ores determined. This cross-cut is 180 feet long and cut through a series of quartz lenses and schist leads, which were found to vary in value from a trace to \$50 per ton gold, but the free condition remained unchanged as in the other parts of the mine. Tests on this work showed an average mill value of \$6 per ton for the whole length of 180 feet.

This is the most important work accomplished in the district for many years, as it demonstrates the existence of great bodies of low grade ore, capable of treatment on a large scale, and indicates the course to be pursued in the other mines of the district.

The present development in the Carissa consists of some 2,500 feet of drifting, cross-cuts, etc., with a shaft 384 feet deep, following the dip of the vein, equipped with hoist and necessary appliances for handling the ore on a limited scale, though it is understood that a new plant, suitable for the thorough development of the mine, is to be erected by the new owners and the whole property thoroughly exploited on a commercial scale.

In the upper portion of the Carissa workings the usual oxidized ores were found, and these were very rich, as shown by the early history of the mine. As development proceeded, the oxidized ores passed out and the sulphide forms came in, being mostly arsenical pyrites, but experience in milling these ores has shown the free gold character of the ore still pertains, and on the lower level from 60 to 90 per cent. of the gold values may be saved upon the plates, and ore is frequently met with that shows free gold associated with the pyrites, both in the quartz and adjacent schists.

The ore has been run through a ten-stamp mill, over amalgamating plates and concentrating tables, the concentrates being saved and the tailings being settled with a view of cyaniding, this process having been experimented with and has given most successful results with these ores.

The full extent of the ores in this mine has not yet been determined, and will require a system of further development by sinking to still greater depths, cross-cutting through and beyond the lenses now known to determine the extent of the profitably mineralized zone, and drifts on the vein to get under the formation that showed great values on the surface in former years, but which have been neglected, but the developments of the past year have shown beyond a doubt that a great mine is here, and, with proper development and treatment of the ore, may be yet made a great property.

At South Pass the Franklin, the Curry and the Carry Shields and others are lying idle for want of capital to push their further deveolpment, and are entitled to a close investigation. A recent discovery is the Copper Surprise, one mile north of the town, where a strong lead has been cut into and shown considerable copper pyrites, carrying fair values in gold that promises well for the future.

Between Atlantic and South Pass are a number of properties that have been worked at various times and a great deal of ore shipped or milled from the properties that now lie idle.

The Doc Barr, Duncan, Richard Albert and others have shown considerable good ore when worked, and are yet undeveloped, but show conditions similar to the Carissa, and merit extensive and persevering development along the lines indicated in the Carissa.

ATLANTIC.

Atlantic City is situated in the central part of the working district, four miles east of South Pass, and is the working headquarters of the Dexter Mining and Development Company of Rochester, N. Y., the principal operators here at the present time, who have recently added to their original large holdings and are now operating the Tabor Grand, the Bryan and Dexter Tunnel, beside a number of smaller works for assessment, etc.

This company holds the placer ground on Rock Creek of the old Christina Lake Placer Company, better known as the Granier Placers, consisting of 1,600 acres of patented placer ground, and controls the whole bed of Rock Creek to its junction with the Sweetwater River, about 3,000 acres, by placer claims held by location in the usual manner.

The Dexter Company have made extensive tests in the bed of this creek by hydraulic elevators and other mechanical means for handling the gravel, and will put in dredges as the result of these experiments. The water for this work is secured from Christina Lake and Rock Creek by a system of about twenty-five miles of ditches, flumes, etc., and a good supply of water is assured.

An interesting feature of these experiments is the high assays obtained from the black sand after the free or placer gold had been taken out, the remaining sand assaying from \$400 to \$800 per ton in many instances.

The Dexter Tunnel is being driven to cross-cut several well defined and well known leads for development purposes, and will cut these different leads at depths varying from 217

to 395 feet in a total length of 2,800 feet, some six leads crossing the line of the tunnel, which has reached a length of 1,200 feet and has cut three blind leads of low grade ore, and is being rapidly pushed ahead by air drills, a complete mechanical plant being installed for this purpose.

This company have installed a hoist and built a shaft house on the Rose or Bryan mine, near the Garfield, above Atlantic, on the line of the Dexter Tunnel, and are sinking a shaft on the vein to connect eventually with the main tunnel, and are running drifts on the vein on two levels. This Bryan mine has produced a great deal of the richest and most beautiful gold ore of the region, but the values have been difficult to save.

The Mormon Crevice is another rich lead that crosses the tunnel line, and the tunnel will develop a number of properties at a depth sufficient to determine beyond a doubt their values and extent.

A new mill is to be erected by the Dexter Company at a point on Rock Creek just below Atlantic to treat both their own and custom ores, extensive experiments having been made during the past year to determine the best method of treatment. This mill will be of 150-ton capacity, using twenty 1,050-pound stamps with amalgamating plates, and having complete cyanide department for saving values other than free gold. The material for this plant is now being freighted in from Point of Rocks station, on the Union Pacific railroad, and will be erected at once.

The Garfield mine has been doing development work in the two lower levels for the past year, cross-cuts being run to determine the value of the lower shoots. A new shaft house has been erected to replace one destroyed by fire.

The Ground Hog Group on Rock Creek, above Atlantic, is one of the best prospects in the district, and shows characteristics similar to the Carissa, having the lenses of quartz ore and heavily mineralized schist carrying profitable values.

Development work only has been done on this property, and it has shown up a fine proposition for further development on a large scale.

Development work has been done on the Mary Ellen, near the Tabor Grand, and the ore milled by a Huntington mill with success. This vein is a fissure and shows very rich ore, and is unique among the bedded veins of this locality, but is evidently a valuable property.

The Pay Rock Group at Peabody Hill shows a number of veins, or quartz stringers, in what is evidently a huge body of ore, but so far developed only to a shallow depth and on the rich streaks. Some 500 feet of development work has been done, mostly drifts, and considerable ore taken out, most of which milled profitably. A tunnel has been run in some 600 feet at a point near the foot of the hill, but has not yet reached the vein.

MINERS' DELIGHT.

On the east side of Peabody Hill, three miles east of Atlantic, the old Miners' Delight mine is located, said to have produced \$1,000,000 in gold, but which has been abandoned for years.

The vein is a fissure from four to six feet wide, associated with the coarse crystalline porphyry noted above, and contained very rich gold values, but was not developed over 200 feet in depth, as far as can now be ascertained.

This ore was free milling and milled on the ground, but no effort was made to do economical work, and the percentage saved was of small importance at that time. It is believed that this property is one of the best high grade development properties in the west, if it is taken up in the right way, as from all data available regarding its previous working, it is evident that no attempt was made to do anything but take out the richest pockets, and systematic development was not thought of.

LEWISTON.

At this camp, which was opened up in 1879, when the famous Burr mine was discovered, development has been slow for the past few years, but this season the several prominent properties have been taken up by new capitalists and renewed activity is apparent.

The Burr shows the same lens condition hitherto noted, and has been very rich, but, aside from the workings on the original lens, little development has taken place. The ore was free milling and easily handled.

The Bullion mine, Iron Duke, Ruby and others in this vicinity have produced heavily at various times, but have not been worked steadily.

Experiments have been made at the Bullion mine with the Cyanide process on the lower grade of ore with success, but results have not been given to the public.

Prospecting is again active in Lewiston, and during the past year a number of lenses of quartz have been found which show the characteristic free gold condition of the Burr and other famous properties, but this camp needs a deep mine similar to the Carissa to demonstrate its value and permanence, and there is no doubt but that the showings here fully warrant the necessary expenditure, in view of the showings already made in other parts of the district.

PLACERS.

In recent years but little placer mining has been done, and that on a small scale, except the plant of the Dexter Mining and Development Company on Rock Creek, below Atlantic, already referred to.

Small placers with sluices, rockers, etc., have been worked in nearly all the gulches of the vicinity with varying success, but at present this work is confined to small workings on Strawberry Gulch, near Miners' Delight, and one or two other places.

Some work has been going on on the old Oregon Butte

Placers, southwest of South Pass, where a dry placer process has been put in, but results have not been reported.

ORES AND TREATMENT.

In the past the attention of the owner and miner has been directed to the high grade ores, but it is upon the great bodies of low grade ores which certainly exist in this vicinity that the district must depend in the future for prosperity of the camps, although it is very likely that other lenses, fully as rich as those of the past, will be opened up and go to swell the production of the district.

The grade of ore of this district has certainly been remarkably high, and had proper care been used in handling or testing the ores, the percentage of values saved would have been equally high, but it is a fact in many instances that ores were sent to the nearest mill without regard to the fitness of the proposed treatment for the ore in question, and when the values were not saved the mine was turned down.

It is admitted that the process of stamping and amalgamating the free values is suited to some of the mines of this district, especially the Carissa, as shown by the mill figures from work actually done at the present plant, but it should be stated with all possible emphasis that this method is not applicable to *all* the ores of this district.

Numerous instances have been stated on good authority, where different lots of ore have been milled and only 10 to 30 per cent. of the values saved, the balance going into the tailings dump or washed into the creeks.

Various reasons have been assigned for this state of affairs, and samples of ores examined have shown the gold in several forms, which left no doubt as to the variety or scope of the processes needed for treatment.

Space does not permit discussion of the ores here, but it may be mentioned that the "brittle gold" and "crystallized

gold," often spoken of in this locality, have been found to be partially oxidized tellurium minerals, which, of course, are not suited for stamping in their natural state and are wasted by such methods, the tailings values almost equaling the original ore values in well defined instances.

"Rusty gold" is common and difficult of saving by amalgamation, as usual, but may be handled with proper precaution.

No one process has yet come to light which would successfully treat all the ores of this district, and before any property is taken up a thorough test at some well equipped and reliable testing works should be made on as large an amount of ore as can be obtained of the grade or kind it is proposed to treat, and the works constructed according to the results obtained from this treatment.

In these tests especial attention should be given to the saving and handling of the fines, of which an unusual amount is often produced from the nature of the minerals and ore constituents here noted.

Attempts have been made at different times to treat the old mine dumps with the Cyanide process, in some instances with success, but in many cases the people handling the work were not familiar with the process and the experiment did not succeed, owing to the ores experimented with not being properly crushed or handled, but it is believed this process, with proper precautions, to be determined by experiment on each ore or property, will undoubtedly be found to be adapted for a large amount of ore in this district.

The results of the extensive experiments in the Dexter Company's ores and those made on some Lewiston ores last year made the Dexter mill possible, and the commercial workings of these ores by this mill will undoubtedly solve many problems that have been local puzzles for many years.

WAGES, FUEL, ETC.

Standard union wages are paid throughout the district, and living is about the same as at other off-the-road camps.

Fuel used is wood, which is delivered by contract at from \$3 to \$3.50 per cord. During the past season some difficulty was experienced in obtaining wood, but if application to cut wood in the forest reserves is made early in the season the desired supply may be readily obtained.

The oils of the Popo-Agie fields, near Lander, are suitable for fuel, and there is no limit to the supply that may be obtained.

Tests on these oils give the following results:

Flashing point	90 degrees Fahrenheit
Burning point	136 degrees Fahrenheit
Specific gravity900
Heating power	10,437 calories per gramme
Gasoline	20-25 per cent.
Kerosene	55-60 per cent.
Light lubricating oils	5-10 per cent.
Paraffine	2-4 per cent.
Coke and loss	4-6 per cent.
Asphaltic residue	None

The oil appears black, is reddish brown by transmitted light and has a strong, disagreeable odor.

In refining this oil, the products are kerosene and gasoline, about 35-40 per cent., and the balance being lubricating oils and asphaltum. The oil is of heavy asphaltum base and suitable for high grade fuel, tests giving 1,571,000-foot pounds of energy per pound of oil. One pound of this oil will convert 19.40 pounds of water at 212 degrees Fahrenheit into steam.

South of the district there are numerous outcrops of coal that have not yet been developed, and with the growth of a demand for coal, this field would be profitably opened up. The coals are lignites of high grade, suitable for steam and heating purposes.

Lumber, etc., may be had at from \$20 to \$30 per M.

Provisions and miners' supplies may be had at South Pass, Atlantic and Lewiston, where well equipped stocks are kept, and prices are about the same as obtain under similar conditions of transportation elsewhere.

Freight rates are quoted at \$1 per cwt., and when ore is loaded out to the railroad a rate of 50 cents per cwt. is made.

CLIMATE.

Work and freighting may be and are carried on at all seasons of the year, as the climate is no more severe here than at other places of similar altitude (viz., 7,500 feet), and the roads are usually in good condition at all seasons.

FUTURE TRANSPORTATION.

The principal drawback to the development of this certainly rich country is the distance from a railroad and the barren character of the intervening country, which makes it a necessity that the camps shall supply the whole business for a connecting road, aside from stock shipments, has prevented any tangible attempt for railroad communication up to the present time, but with the wonderfully rich agricultural country that lies around Lander, and the other resources of that vicinity being so rapidly developed, it is certain that this objection will be removed within a comparatively short time and the question of transportation solved.

Briefly, it may be stated that the South Pass gold district is not a bonanza country, although the past history of the region records some wonderful finds, but it is certainly worthy of the close attention and investigation of the mining investor who understands his business and is competent, both financially and technically, to develop promising prospects into paying mines under the present conditions of transportation and to experiment with the ore conditions until a satisfactory process of treatment is developed.